1-1-1960

The Surficial Geology of the Sandy River Valley: From Framington to Norridgewock, Maine

Caldwell, D.W.

TRIP C

THE SURFICIAL GEOLOGY OF THE SANDY RIVER VALLEY FROM FARMINGTON TO NORRIDGEWOCK, MAINE

Leader: D. W. Caldwell

INTRODUCTION

Pleistocene age sediments exposed in the Sandy River valley offer a varied and interesting picture of late-glacial and post-glacial events in Central Maine.

Following the melting of the last continental ice in the area, a portion of the valley upstream was occupied by a glacial lake and the lower valley was submerged briefly by the ocean. Clays deposited in this lake and in the ocean are the sediments with which this field trip will be principally concerned. Exposures have been chosen to illustrate the relation of the clay deposits to both the stratigraphically older and younger sediments in the Sandy River valley. Evidence by which marine clay may be distinguished from lake clay will be considered. although no agreement on this subject is expected. One exposure contains well preserved marine molluscan fossils from which specimens may be collected.

A buried soil, tentatively dated as pre-Wisconsin in age on the basis of radiocarbon dating of fossil wood and a preliminary pollen study, underlies the youngest till of the Sandy River area and overlies an older till. An excellent natural exposure of these sediments and a recent bulldozed exposure of the buried soil offer one of the finest exposures of Pleistocene sediments to be found in New England. It is not expected that any agreement will be reached concerning the interpretation of these sediments, but it is hoped that a discussion of the sediments may result in the airing of several possible interpretations.

In the road log which follows, some of the interesting and significant features to be seen at each of the field trip stops will be discussed briefly and a few features or exposures at which stops will not be made are mentioned. The Farmington and Norridgewock quadrangle maps, U. S. Geological Survey, show all of the area under consideration and many of the localities to be visited are described in detail in a report published by the Maine Geological Survey dealing with the clay deposits of the Sandy River (Caldwell, 1959). Other literature which deals in part with the Sandy River valley may be found in Stone (1899), Leavitt and Perkins (1935), Trefethen (1947) and Goldthwait (1949).

ROAD LOG

The trip will start at the new dormitory of the Farmington State Teachers College on the south side of Main Street. The mileage shown in the following log is measured from the dormitory. A map of the location of the field trip stops is shown in Figure 1.

Trip C Road Log

Miles from Farmington, Maine.

0.0 Start at Farmington State Teachers College men's dormitory on south side of Main Street. Follow Route 4 and U. S. 2 across Sandy River to West Farmington

1.0 Park on right side of U. S. 2 after crossing Temple Stream. Walk 0.3 miles to clay pit of West Farmington Brick Company.

Stop #1. The clay pit which provides the material used at the West Farmington brick yard affords a good exposure of the lake clay deposited in that area. Approximately 30 feet of clay is exposed in the pit and at least 20 feet more underlies the exposed clay. 1 to 3 feet of fine sand overlies the clay. The upper 20 feet of clay is brown in color and is thought to have been oxidized from the gray-colored clay. Limonite concretions occur in thin sandy partings in the brown clay.

1.3 Return to cars, make U-turn and proceed toward Farmington on U. S. 2. At 1.3 miles turn left at Information Service and take first left-hand turn to West Farmington Brick Company.

Stop #2. West Farmington Brick Company. There will be a short tour of the brick yard, which specialized in water-struck brick.

2.4 Leave brick yard, taking 1st right turn and then left onto U. S. 2. Road crosses flat terrace surface, 400 feet in elevation, which represents outwash plain covering lake clay deposits.

3.2 Stop #3. Park on right side of U. S. 2. Sand pit on left exposes foreset delta bedding. An interesting loess-like silt is exposed in small pit near sand pit. Lake clay underlies these coarser sediments.

3.6 Preceed eastward on U. S. 2. Irregular topography on hill crest is possible fossil dune topography.

4.2 Beyond motel, meander terraces, cut into both the outwash sediments and lake clays, may be seen.

4.7 Road crosses wide meander terrace with outwash plain surface on left. Esker-like ridge is actually narrow remnant of outwash plain.

6.0 Stop #4. Active sand dune area. The sand is derived from outwash sediments and probably became active as a result of overgrazing. Both deltaic and current bedding are exposed in sand pit.

6.4 Proceed eastward on U. S. 2 turning right on Route 41 at 6.4 miles.

6.7 Cross Sandy River. Staurolite schist outcrop on right is only outcrop in channel for more than 10 miles. Turn left after crossing bridge.

7.6 Prominent meander scars and terrace on left. Road is on the original outwash plain surface.

8.3 Stop #5. Undercut slope on meander bend exposes more than 30 feet of interbedded sand and silt with well-preserved ripple marks and varve banding. Gray lake clay is exposed at river level and is at least 30 feet thick as determined by hand auger. The bedding structures in the sand and silt overlying the clay suggest that the coarser sediments were also deposited in standing water, i.e. the lake in which the underlying clay was deposited.

9.2 Proceed along dirt road to junction with Route 134.

10.0 Excellent view of Sandy River valley on left. Dune area at Stop No. 4 visible slightly north of west. On skyline slightly to right of dune area is Mt. Blue. Saddleback Mountain, Mt. Abraham and Sugarloaf Mountain from the skyline toward the north.

10.6 Stop #6. Large esker-like ridges on hill slopes. Composed of medium to fine sand (median diameter = 0.30mm, S_o= 1.54) and may be eolian in origin. Discussion of these features will be welcomed.

11.4 Juncture with U. S. 2. Turn left and cross Sandy River. Notice exposure of gray till on bank of the river down-stream (right) from bridge.

11.6 Turn right on Route 134. 15 minute rest stop at this point. Rest rooms are available at service station on U. S. 2 beyond 134 juncture. Grocery stores, etc., in village.

12.0 Till is exposed from road down to the river, an elevation difference of about 100 feet.

12.2 Stop #7. Lunch will be eaten sometime during this stop and it is suggested that eating materials be taken to the river. Bull-dozed exposure of buried soil shows both the overlying and underlying till. Fragments of wood from soil are dated as more than 35,000 years B.P. (Y-689), suggesting a non-glacial interval older than the classic Wisconsin is recorded (Flint, 1956). A preliminary pollen study of the soil shows a high spruce and pine content and a lack of hemlock pollen, implying a climate somewhat cooler than the present. If this interpretation is valid, the soil was formed, not during the Sangamon interval, but during a post-Sangamon, pre-classic-Wisconsin, non-glacial interval. In this respect, the buried soil at New Sharon is similar to certain non-glacial deposits in Canada described by Terasmae (1958, 1960). Till and interbedded varved clay is exposed across the river from the buried soil locality. The lower till exposed on the south bank evidently is the same age as the till which underlies the buried soil on the north bank and the upper till on the south bank may be correlated with the till which overlies the soil on the north bank. An interesting feature of the lower till is the carbonate concretious which occur in this sediment. These concretions may be controlled in the channel and from gravel bars downstream from the bank exposures. It might be pointed out that fine specimens of red jasper also may be found in these gravel bars. Leaving Stop #7, proceed around corner and turn around in field on left. Proceed back along Route 134 to U. S. 2.

13.8 Turn left beyond motel and restaurant on crest of hill.

14.4 Stop #8. Marine clay overlying till and deformed outwash sediments. A major meander cut-off occurred here during the 1936 spring floods (compare river as shown on Farmington quadrangle with that on Norridgewock quadrangle).

15.9 Junction with U. S. 2, turn left on U. S. 2.

24.6 Esker mantled with marine clay crosses highway.

25.4 Turn left at Twin Pines Motel.

25.6 Turn right into gravel pit.

25.8 Stop #9. Gravel pit in esker. Faulted bedding structures in esker sediments. Esker partly mantled by marine clay. Clay contains well preserved marine pelecypod and gastropod fossils. Similar shells from clay near Clinton, Maine, about 15 miles from Norridgewock, are dated as 11,800 ± 200 years old (W-737).

REFERENCES CITED

Caldwell, D. W., (1959) Glacial lake and glacial marine clay of the Farmington area, Maine. Special Geologic Studies No. 3, Maine Geological Survey.

Flint, R. F., (1956) New radiocarbon dates and late-Pleistocene stratigraphy, Am. Jour. Sci., vol. 254, pp.265-287.

Goldthwait, L. G., (1949) Clay Survey - 1948 - Rept. of the State Geologist, 1947-48. Maine Development Commission, pp. 63-69.

Leavitt, H. W. and Perkins E. H., (1935) Glacial geology of Maine, Maine Tech. Exper. Sta., Bull. 30, vol. 2.

Stone, G. H, (1899) The glacial gravels of Maine and their associated deposits, U. S. G. S., monograph 34.

Terasmae, J., (1958) Contributions to Canadian palynology No. 1, Bull. 46, Canadian Geological Survey.

_____ (1960) Contributions to Canadian palynology No. 2, Bull. 56, Canadian Geological Survey.

Trefethen, J. W., (1947) Preliminary report on Maine clays. Rept. of the State Geol., Maine Development Comm., pp. 10-46.

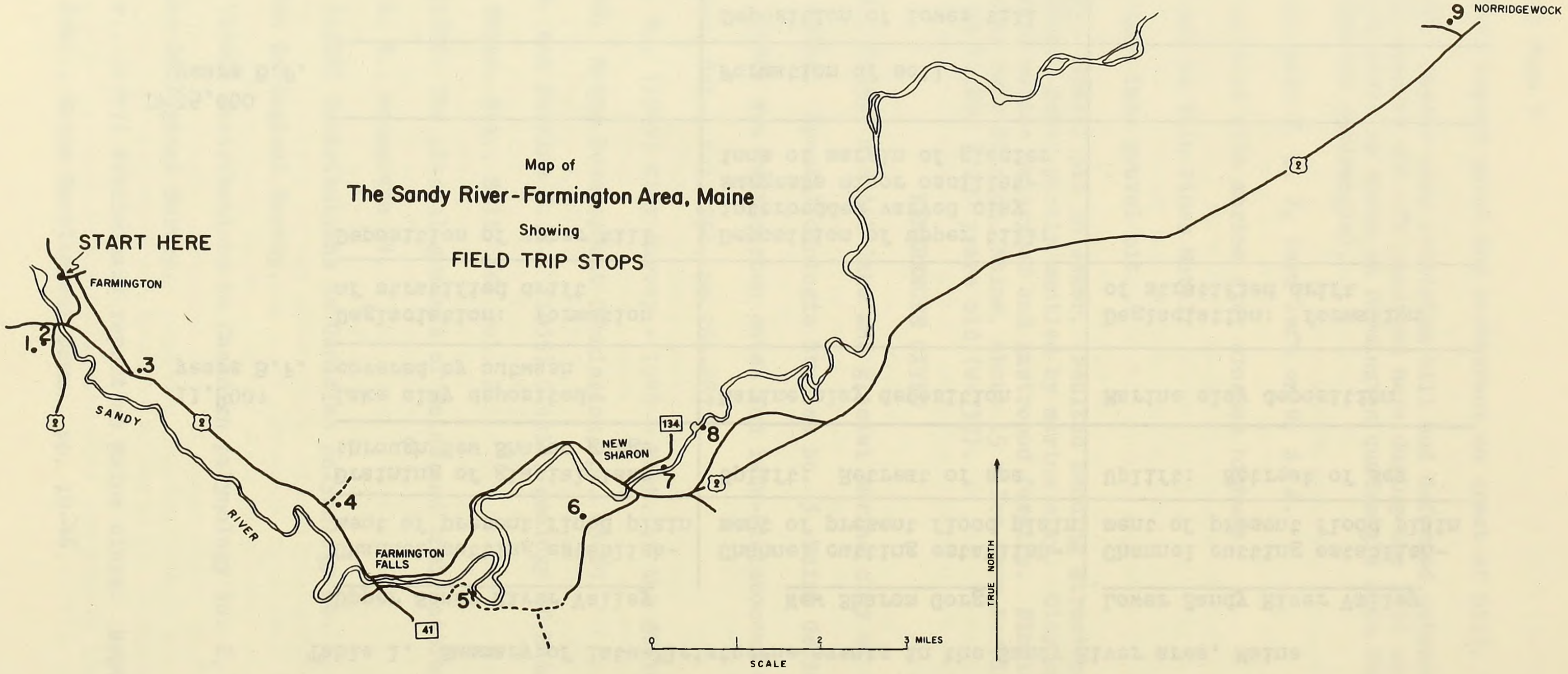
Summary.

The sequence of events and tentative correlation implied by the Pleistocene sediments in the Sandy River valley are presented in Table 1.

Table 1. Summary of late-Pleistocene events in the Sandy River area, Maine

	Upper Sandy River Valley	New Sharon Gorge	Lower Sandy River Valley
	Channel cutting establishment of present flood plain	Channel cutting establishment of present flood plain	Channel cutting establishment of present flood plain
	Draining of glacial lake through New Sharon gorge	Uplift: Retreat of sea	Uplift: Retreat of sea
11,800? years B.P.	Lake clay deposited-covered by outwash	Marine clay deposition	Marine clay deposition
	Deglaciation: formation of stratified drift		Deglaciation: formation of stratified drift
	Deposition of upper till	Deposition of upper till: interbedded varved clay suggests minor oscillations of margin of glacier	
> 35,000 years B.P.		Formation of soil	
		Deposition of lower till	

FIGURE 1.


Map of
The Sandy River - Farmington Area, Maine
Showing
FIELD TRIP STOPS
START HERE
FARMINGTON
1.2
.3
SANDY
RIVER
.4
FARMINGTON FALLS
5.
6.
NEW SHARON
134
7
8
.9
NORRIDGEWOCK
2
41
0
1
2
3 MILES
SCALE
TRUE NORTH